

IN THE CLAIMS:

1 1. A method enabling a user in a mobile environment to conduct transactions via a self-
2 service merchant terminal, comprising:

3 a) maintaining a security key in a mobile phone device;

4 b) imprinting at least an association of the security key and a mobile phone
5 identification into at least one associated portable pilot;

6 c) transferring at least the association of the security key and the mobile phone
7 identification from the pilot to a self-service merchant terminal through an initial short-range
8 radio link; and

9 d) establishing a secure short-range connection between the self-service terminal and
10 the mobile phone based on the transferred security key and the mobile phone identification
11 information, wherein the initial short-range radio link has a significantly smaller radio coverage
12 than the secure short-range connection.

1 2. The method of claim 1, wherein the secure short-range connection is used to conduct
2 transactions without using currency.

1 3. The method of claim 1, wherein the initial short-range radio link complies with RFID
2 technology.

1 4. The method of claim 1, wherein the secure short-range connection complies with
2 Bluetooth technology.

1 5. The method of claim 1, wherein the coverage area of the short-range radio link is under
2 10 centimeters.

1 6. The method of claim 1, wherein the mobile phone identification is a Bluetooth address of
2 the mobile phone.

1 7. The method of claim 1 further comprising:

2 e) receiving a user transaction interface at the terminal upon establishment of the
3 secure short-range connection.

1 8. The method of claim 1 further comprising:

2 f) providing the at least one pilot a random number and a sequence number (SEQ)
3 in response to a request for a secure connection between the terminal and the device.

1 9. The method of claim 1 further comprising:

2 g) computing a $RES=f(\text{random number, SEQ, secret key (k)})$ and session key K' by
3 the pilot and sending the RES and K' to the terminal.

1 10. The method of claim 1 further comprising:

2 h) using the session key by the terminal to establish the secure connection with the
3 device.

1 11. The method of claim 1 further comprising:

2 i) deriving the session key by the device and using the derived session key for
3 secure short-range communication with the terminal.

1 12. The method of claim 1 further comprising:

2 j) verifying the presence of a correct pilot by the terminal via computing an
3 expected response of $XRES=f(\text{random number, SEQ, K})$ and verifying whether $RES=XRES$.

1 13. The method of claim 1 further comprising:

2 k) using symmetric keys for encryption/decryption of information transferred
3 between the terminal and the device.

1 14. The method of claim 1 further comprising:

2 l) using public key infrastructure for encryption/decryption of information
3 transferred between the terminal and the device.

1 15. The method of claim 1 further comprising:

2 m) storing a plurality of authentication codes in the at least one pilot for one time use
3 in initiating secure connection requests.

1 16. The method of claim 1 further comprising:

2 n) storing a plurality of authentication codes for one time use in the device for
3 establishing short-range connections between the device and the terminal.

1 17. The method of claim 1 further comprising:

2 o) transferring payment information from the terminal to the device via the secure
3 channel based upon a session key K' ;

4 p) automatically accepting the payment information by the device; and

5 q) using a communication channel either provided by the terminal or the device to
6 conduct a transaction.

18. The method of claim 1 further comprising:

- r) sending a request to the device by the terminal for the device to launch a payment application;
- s) launching the payment application after the device verifies the presence of a correct pilot;
- t) using the payment application at the terminal to launch a legacy payment client; and
- u) finalizing the transaction by a user at a user-interface displayed at the terminal.

19. A system for enabling a user in a mobile environment to conduct transactions via a self-service terminal, comprising:

- a) a mobile device including a short-range communication transceiver and an RFID transceiver;
- b) a portable pilot device associated with the mobile device and including a semi-passive RFID transponder;
- c) a self-service terminal including a RFID transceiver and a short-range transceiver;
- d) means for storing identification information and at least security information in the mobile device;
- e) means for imprinting said stored identification and at least an association of the security information of the device over an RFID connection into the associated portable pilot;
- f) means for transferring by the pilot said imprinted identification and security information to the self-service terminal over an RFID connection; and
- g) means for establishing a secure short-range connection between the self-service terminal and the device based on said transferred identification and security information of the device, wherein the RFID connection has significantly smaller radio coverage than the secure short-range connection.

1 20. The system of claim 19, wherein the secure short-range connection is used to conduct
2 transactions without using currency.

1 21. The system of claim 19 wherein the self-service terminal receives a user transaction
2 interface upon establishment of the secure connection.

1 22. The system of claim 19 further comprising:

2 h) means for storing a plurality of authentication codes for one time use in
3 establishing a connection between the pilot and the device.

1 23. The system of claim 19 further comprising:

2 i) means for storing a plurality of authentication codes for one time use in
3 establishing short-range connections between the device and the terminal.

1 24. The system of claim 19 wherein the pilot identifies the device for a short-range
2 connection and initializes a security context.

1 25. The system of claim 19 wherein the user operates the user transaction interface at the
2 terminal.

1 26. The system of claim 19 further comprising:

2 j) means activating the terminal for establishing a secure connection to the device.

1 27. Apparatus enabling a user in a mobile environment to activate a self-service terminal to
2 conduct transactions, comprising:

- 3 a) a semi-passive transponder for responding to RF signals transmitted by an
4 associated mobile device;
- 5 b) a memory coupled to the transponder;
- 6 c) a processor coupled to the transponder and the memory; and
- 7 d) means responsive to the transponder for storing unique information related to a
8 mobile device.

1 28. The apparatus of claim 27 comprising:

- 2 e) means for transmitting the stored information to the self-service terminal after
3 activation from the terminal.

1 29. The apparatus of claim 27 further comprising:

- 2 f) means for exchanging authentication information with a mobile device for
3 receiving the unique information related to the mobile device to be provided to the self-service
4 terminal for initiating a secure connection between the mobile device and the self-service
5 terminal.

1 30. The apparatus of claim 27 further comprising:

- 2 g) means for exchanging authentication information with the self-service terminal
3 for initiating a secure connection between the mobile device and the self-service terminal..

1 31. The apparatus of claim 27 further comprising:

- 2 h) means for storing a plurality of authentication codes for one time use in
3 establishing a connection between the pilot and the device.

1 32. The apparatus of claim 27 further comprising:

2 i) means for identifying the device for a short-range connection between the
3 terminal and the device and initializing a security context.

1 33. A medium, executable in a computer system, enabling a user in a mobile environment to
2 activate a self-service terminal to conduct transactions, the medium comprising:

3 a) program code for storing at least a security key in a mobile phone device;

4 b) program code for imprinting at least an association of the security key and mobile
5 phone device identification in a portable pilot associated with the mobile phone device;

6 c) program code for transferring at least the association of the security key and
7 mobile phone device identification from the pilot to a self-service terminal through an initial
8 short-range radio link; and

9 d) program code for establishing a secure short-range connection between the self-
10 service terminal and the mobile phone device for conducting transactions based on the
11 transferred security key and mobile phone device identification, wherein the initial short-range
12 link has a significantly smaller radio coverage than the secure short-range connection.

1 34. The medium of claim 33 further comprising:

2 e) program code in the terminal for downloading a user interface from the mobile
3 phone device after establishment of a secure connection with the mobile phone device.

1 35. The medium of claim 33 further comprising:

2 f) program code for conducting product or service transactions between the
3 terminal and the mobile phone device without using currency.

1 36. The medium of claim 33 wherein the terminal is within a merchant establishment or in a
2 kiosk.

1 37. A method of enabling a first pilot device to serve as a master pilot for at least one second
2 pilot devices as slave devices capable of interacting with a terminal, comprising:

3 installing a reader and switching means in the first pilot device serving as a master device
4 and further including a processor and storage means;

5 Imprinting and storing in the master pilot device a phone address and a security key of a
6 mobile phone;

7 At least one second pilot device, each serving as a slave device to the master device and
8 further including a processor and storage, each slave device capable of receiving and transmitting
9 signals from/to the master device;

10 Imprinting the phone address, security key and policy restraints in a slave device after
11 receiving an address identifying the slave device; and

12 using the slave device to interact with a terminal to purchase an item, after a secure
13 connection is established between the terminal and the mobile phone.

1 38. The method of claim 37, wherein the imprinting step further comprises:

2 limiting the validity of the at least one portable pilot based on a predefined policy
3 constraint.

1 39. The method of claim 37, wherein the predefined policy constraint includes at least one of
2 a maximum purchase value and a maximum time limit.

1 40. The method of claim 37 further comprising:

2 storing a list of prohibited purchase items in the slave device.

1 41. The method of claim 37 further comprising:

2 transmitting a list of purchased items from the terminal to the slave device.

- 1 42. The method of 37 further comprising:
2 comparing the purchased items to prohibited items stored in the slave device.
- 1 43. The method of claim 37 further comprising:
2 verifying in the slave device that no purchased item is a prohibited item.
- 1 44. The method of claim 37 wherein a policy restraints limits usage of the slave device to a
2 maximum value for a purchased item.
- 1 45. The method of claim 37 wherein the policy restraints limits usage of the slave device to
2 a maximum time period.
- 1 46. The method of claim 37 wherein the terminal receives a signal from the slave indicating
2 approval or denial of a purchased item.
- 1 47. The method of claim 37 wherein the terminal displays approval or denial of the
2 purchased items after receiving a signal from the slave device.
- 1 48. The method of claim 37 wherein the slave device touches or holds the slave device in
2 close proximity to the terminal to authorize payment for the purchased after the terminal displays
3 approval of the purchased by the slave device.